# Complete Summary

## GUIDELINE TITLE

Hypertension evidence-based nutrition practice guideline.

## BIBLIOGRAPHIC SOURCE(S)

American Dietetic Association (ADA). Hypertension evidence based nutrition practice guideline. Chicago (IL): American Dietetic Association (ADA); 2008. Various p. [3 references]

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: White JV. Hypertension. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 15 p.

The guideline will undergo a complete revision every three to five years.

## COMPLETE SUMMARY CONTENT



## SCOPE

### DISEASE/CONDITION(S)

Hypertension:

- Prehypertension (120-139/80-89 mmHg)
- Stage 1 hypertension (140-159/90-99 mmHg)
- Stage 2 hypertension (>160/>100 mmHg)

### GUIDELINE CATEGORY

Evaluation
Management
Treatment

## CLINICAL SPECIALTY

Cardiology
Family Practice
Geriatrics
Internal Medicine
Nutrition
Pharmacology
Physical Medicine and Rehabilitation
Preventive Medicine

## INTENDED USERS

Dietitians

## GUIDELINE OBJECTIVE(S)

### Overall Objective

- To help dietetic practitioners, patients and consumers make shared decisions about health care choices in specific clinical circumstances
- To provide medical nutrition therapy guidelines for hypertension

### Specific Objectives

- To define evidence-based recommendations for registered dietitians (RDs) that are carried out in collaboration with other healthcare providers
- To guide practice decisions that integrate medical, nutritional and behavioral elements
- To reduce variations in practice among RDs
- To promote self-management strategies that empower the patient to take responsibility for day-to-day management and to provide the RD with data to make recommendations to adjust Medical Nutrition Therapy or recommend other therapies to achieve clinical outcomes
- To enhance the quality of life for the patient, utilizing customized strategies based on the individual's preferences, lifestyle and goals
- To develop content for intervention that can be tested for impact on clinical outcomes
- To define the highest quality of care within cost constraints of the current healthcare environment

## TARGET POPULATION

Adult patients 19 years and older who are classified as having prehypertension (120-139/80-89 mm Hg), stage 1 hypertension (140 -159/90-99 mm Hg), or stage 2 hypertension (>160/>100 mm Hg)

Population groups, medical conditions or coexisting diagnoses, where the hypertension recommendations may be indicated, include:

- Cardiovascular disease
- Diabetes mellitus (type 2)
- Obesity

### INTERVENTIONS AND PRACTICES CONSIDERED

#### Evaluation

1. Referral to a registered dietitian
2. Nutritional assessment
    - Medical history and relevant laboratory values for existing comorbidities
    - Nutrition-focused assessment including:
        - Height, weight, body mass index (BMI), waist circumference and blood pressure
        - Comprehensive diet history, including current dietary intake and receptivity to change
        - Physical activity pattern
        - Psychosocial and economic issues impacting nutrition therapy
        - Consideration of comorbid conditions and need for additional modifications in nutrition care plan

#### Management/Treatment

1. Individualized prescription for medical nutrition therapy based on:
    - Dietary interventions, including Dietary Approaches to Stop Hypertension (DASH) dietary pattern and weight management
    - Physical activity interventions
    - Behavioral interventions
    - Pharmacotherapy, when indicated

2. Patient monitoring

### MAJOR OUTCOMES CONSIDERED

- Morbidity
- Mortality
- Quality of life
- Percentage of patients who are able to meet their treatment goal of reducing blood pressure
- Changes in laboratory values
- Cost of medical care

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

## DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Searches of PubMed and CENTRAL databases, and hand searches of other relevant literature were performed on the following topics:

- Dietary sodium
- Dietary magnesium
- Dietary potassium
- Dietary calcium
- Caffeine
- Dietary protein
- Soy foods
- Fruits and vegetables
- Soluble fiber
- Vitamins
- Omega-3 fatty acids
- Garlic
- Cocoa and chocolate

General Exclusion Criteria

As a general rule, studies are excluded if the:

- Study sample size is less than 10 in each treatment group
- Drop-out rate was >20%

Inclusion Criteria

- Study design preferences: randomised controlled trials or clinical controlled studies, large nonrandomized observational studies, and cohort and case-control studies
- Limited to articles in English

The American Dietetic Association (ADA) has determined that for narrowly focused questions dealing with therapy or treatment, six well designed randomized controlled trials that demonstrate similar results is sufficient to draw a conclusion.

No one study design was preferred for all questions. The preferred study design depended on the type of question. The ADA uses the following principles in the table below for identifying preferred study design.

| Type of Question | Preferred Study Designs (in order of preference) |
|---|---|
| Diagnosis questions | Sensitivity & specificity of diagnostic test<br><br>Cross-sectional study |

| Type of Question | Preferred Study Designs (in order of preference) |
|---|---|
| Etiology, causation, or harm questions | Prospective Cohort<br><br>Case Control Study<br><br>Cross-sectional study |
| Therapy and prevention questions | Randomized controlled trial<br><br>Nonrandomized trial |
| Natural history and prognosis questions | Cohort study |

**NUMBER OF SOURCE DOCUMENTS**

Not stated

**METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Weighting According to a Rating Scheme (Scheme Given)

**RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

**Grading the Strength of the Evidence for a Conclusion Statement or Recommendation Conclusion Grading Table**

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| **Quality**<br><br>• Scientific rigor/validity<br>• Considers design and execution | Studies of strong design for question<br><br>Free from design flaws, bias and execution problems | Studies of strong design for question with minor methodological concerns<br><br>OR<br><br>Only studies of weaker study design for question | Studies of weak design for answering the question<br><br>OR<br><br>Inconclusive findings due to design flaws, bias or execution problems | No studies available<br><br>Conclusion based on usual practice, expert consensus, clinical experience, opinion, or extrapolation from basic research | No evidence that pertains question being addresse |
| **Consistency** | Findings generally | Inconsistency among results | Unexplained inconsistency | Conclusion supported | NA |

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| Of findings across studies | consistent in direction and size of effect or degree of association, and statistical significance with minor exceptions at most | of studies with strong design<br><br>OR<br><br>Consistency with minor exceptions across studies of weaker designs | among results from different studies<br><br>OR<br><br>Single study unconfirmed by other studies | solely by statements of informed nutrition or medical commentators | |
| **Quantity**<br><br>• Number of studies<br>• Number of subjects in studies | One to several good quality studies<br><br>Large number of subjects studies<br><br>Studies with negative results having sufficiently large sample size for adequate statistical power | Several studies by independent investigators<br><br>Doubts about adequacy of sample size to avoid Type I and Type II error | Limited number of studies<br><br>Low number of subjects studies and/or inadequate sample size within studies | Unsubstantiated by published studies | Relevan<br>studies<br>have no<br>been do |
| **Clinical Impact**<br><br>• Importance of studies outcomes<br>• Magnitude of effect | Studied outcome relates directly to the question<br><br>Size of effect is clinically meaningful<br><br>Significant (statistical) difference is large | Some doubt about the statistical or clinical significance of effect | Studies outcome is an intermediate outcome or surrogate for the true outcome of interest<br><br>OR<br><br>Size of effect is small or lacks statistical and/or clinical significance | Objective data unavailable | Indicate<br>area for<br>future<br>research |

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| **Generalizability**<br><br>To population of interest | Studied population, intervention and outcomes are free from serious doubts about generalizability | Minor doubts about generalizability | Serious doubts about generalizability due to narrow or different study population, intervention or outcomes studied | Generalizability limited to scope of experience | NA |

This grading system was based on the grading system from: *Greer N, Mosser G, Logan G, Wagstrom Halaas G. A practical approach to evidence grading. Jt Comm. J Qual Improv. 2000; 26:700-712*. In September 2004, The ADA Research Committee modified the grading system to this current version.

## METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

### Step 1: Formulate the question

Specify a question in a defined area of practice; or state a tentative conclusion or recommendation that is being considered. Include the patient type and special needs of the target population involved, the alternatives under consideration, and the outcomes of interest.

### Step 2: Gather and classify evidence reports

Conduct a systematic search of the literature to find evidence related to the question, gather studies and reports, and classify them by type of evidence. Classes differentiate primary reports of new data according to study design, and distinguish them from reports that are a systematic review and synthesis of primary reports.

### Step 3: Critically appraise each report

Review each report for relevance to the question and critique for scientific validity. Abstract key information from the report and assign a code to indicate the quality of the study by completing quality criteria checklist.

### Step 4: Summarize evidence in a narrative and an overview table

Combine findings from all reports in a table that pulls out the important information from the article worksheets. Write a brief narrative that summarizes and synthesizes the information abstracted from the articles that is related to the question asked.

### Step 5: Develop a conclusion statement and grade the strength of evidence supporting the conclusion

Develop a concise conclusion statement (the answer to the question), taking into account the synthesis of all relevant studies and reports, their class and their quality ratings. Assign a grade to indicate the overall strength or weakness of evidence informing the conclusion statement.

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The expert work group, which includes practitioners and researches with a depth of experience in the specific field of interest, develops the disease-specific guideline. The guideline development involved the following steps:

### Review Evidence Based Conclusions

The work group meets to review the materials resulting from the evidence analysis, which may include conclusion statements, evidence summaries, and evidence worksheets.

### Formulate Recommendations for the Guideline Integrating Conclusions from Evidence Analysis

The work group uses an expert consensus method to formulate recommendations, taking into account the following:

- Recommendations for what the dietitian should do and why
- Rating of recommendations based on strength of supporting evidence
- Label of Conditional (clearly define a specific situation) or Imperative (broadly applicable to the target population without restraints on the pertinence)
- Risks and Harms of Implementing the Recommendations, including potential risks, harms, or adverse consequences
- Conditions of Application, including organizational barriers or conditions that may limit application
- Potential Costs Associated with Application
- Recommendation Narrative
- Recommendation Strength Rationale, evidence strength and methodological issues
- Minority Opinions, when the expert working group cannot reach consensus on a recommendation
- Supporting Evidence

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

### Criteria for Recommendation Rating

| Statement Rating | Definition | Implication for Practice |
|---|---|---|
| **Strong** | A **Strong** recommendation means that the workgroup believes that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits in the case of a strong negative recommendation), and that the quality of the supporting evidence is excellent/good (grade I or II)*. In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms. | Practitioners should follow a **Strong** recommendation unless a clear and compelling rationale for an alternative approach is present. |
| **Fair** | A **Fair** recommendation means that the workgroup believes that the benefits exceed the harms (or that the harms clearly exceed the benefits in the case of a negative recommendation), but the quality of evidence is not as strong (grade II or III)*. In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms. | Practitioners should generally follow a **Fair** recommendation but remain alert to new information and be sensitive to patient preferences. |
| **Weak** | A **Weak** recommendation means that the quality of evidence that exists is suspect or that well-done studies (grade I, II, or III)* show little clear advantage to one approach versus another. | Practitioners should be cautious in deciding whether to follow a recommendation classified as **Weak**, and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role. |
| **Consensus** | A **Consensus** recommendation means that Expert opinion (grade IV)* supports the guideline recommendation even though the | Practitioners should be flexible in deciding whether to follow a recommendation classified **Consensus**, although they may |

| Statement Rating | Definition | Implication for Practice |
|---|---|---|
| | available scientific evidence did not present consistent results, or controlled trials were lacking. | set boundaries on alternatives. Patient preference should have a substantial influencing role. |
| **Insufficient Evidence** | An **Insufficient Evidence** recommendation means that there is both a lack of pertinent evidence (grade V)* and/or an unclear balance between benefits and harms. | Practitioners should feel little constraint in deciding whether to follow a recommendation labeled as **Insufficient Evidence** and should exercise judgment and be alert to emerging publications that report evidence that clarifies the balance of benefit versus harm. Patient preference should have a substantial influencing role. |

*Conclusion statements are assigned a grade based on the strength of the evidence. Grade I is good; grade II, fair; grade III, limited; grade IV signifies expert opinion only and grade V indicates that a grade is not assignable because there is no evidence to support or refute the conclusion. The evidence and these grades are considered when assigning a rating (Strong, Fair, Weak, Consensus, Insufficient Evidence - see chart above) to a recommendation.

Adapted by the American Dietetic Association from the American Academy of Pediatrics, Classifying Recommendations for Clinical Practice Guideline, Pediatrics. 2004;114;874-877.

### COST ANALYSIS

An analysis was performed of potential costs associated with application of the recommendations in the guideline.

### METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Each guideline is reviewed internally and externally using the AGREE (Appraisal of Guidelines for Research and Evaluation) instrument as the evaluation tool. The external reviewers consist of a multidisciplinary group of individuals (may include dietitians, doctors, psychologists, pharmacists, nurses, etc.). The review is done electronically. The guideline is adjusted by consensus of the expert panel and approved by American Dietetic Association's Evidence-Based Practice Committee prior to publication on the Evidence Analysis Library (EAL).

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

***Note from the National Guideline Clearinghouse (NGC) and the American Dietetic Association (ADA)***: Several recommendations of this guideline were based on the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7). The purpose of JNC 7 is to provide an approach to the prevention and management of hypertension. The hypertension working group did not review topics that were already addressed in the review conducted by the JNC 7 group.

Ratings for the strength of the recommendations (Strong, Fair, Weak, Consensus, Insufficient Evidence), conclusion grades (I-V), and statement labels (Conditional versus Imperative) are defined at the end of "Major Recommendations."

**Hypertension (HTN): Classification of Blood Pressure**

**HTN: Blood Pressure Measurement in Assessment**

Blood pressure measurement should be used to classify blood pressure as Normal, Prehypertension, or Hypertension (Stage 1 or Stage 2), to estimate risk for disease, and to identify treatment options. Elevated blood pressure is associated with risk of damage to the heart (left ventricular hypertrophy [LVH], angina, myocardial infarction [MI], coronary artery disease, heart failure), brain (transient ischemic attack [TIA], stroke, dementia), kidney (chronic kidney disease [CKD]), peripheral arteries, and eyes (retinopathy).

**Consensus**, Imperative

**HTN: Blood Pressure Measurement in Monitoring and Evaluation**

Blood pressure measurement should be used to monitor and evaluate the effectiveness of therapy. Elevated blood pressure is associated with risk of damage to the heart (LVH, angina, MI, coronary artery disease, heart failure), brain (TIA, stroke, dementia), kidney (CKD), peripheral arteries, and eyes (retinopathy).

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding classification of blood pressure**.

**Hypertension (HTN): Food/Nutrient and Medication Interaction**

**HTN: Food/Nutrient and Medication Interaction Assessment**

Dietitians should assess food/nutrient-medication interactions in patients that are on pharmacologic therapy for hypertension, as many antihypertensive medications interact with food and nutrients.

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding food/nutrient and medication interactions**.

**Hypertension (HTN): Dietary Approaches to Stop Hypertension (DASH) Dietary Pattern**

**HTN: DASH Diet**

Individuals should adopt the DASH dietary pattern which is rich in fruits, vegetables, low-fat dairy, and nuts; low in sodium, total fat, and saturated fat; and adequate in calories for weight management. The DASH dietary pattern reduces systolic blood pressure by 8 to 14 mm Hg.

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding DASH dietary pattern**.

**Hypertension (HTN): Physical Activity**

**Physical Activity**

Dietitians should encourage individuals to engage in aerobic physical activity for at least 30 minutes per day on most days of the week, as it reduces systolic blood pressure by approximately 4 to 9 mmHg.

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding physical activity**

**Hypertension (HTN): Dietary Sodium**

**HTN: Sodium Intake**

Dietary sodium intake should be limited to no more than 2300 mg sodium (100 mmol) per day. Reduction of dietary sodium to recommended levels lowers systolic blood pressure by approximately 2 to 8 mm Hg.

**Strong**, Imperative

**HTN: Sodium Intake Monitoring and Evaluation**

If the patient demonstrates adherence to a 2300 mg sodium diet but has not achieved the treatment goal, then the dietitian should recommend the DASH dietary pattern and/or reduction in sodium to 1600 mg to further reduce blood pressure.

**Strong**, Conditional

**Recommendation Strength Rationale**

- **Conclusion statement is Grade I**

**Hypertension (HTN): Weight Management**

**Weight Management**

Optimal body weight should be achieved and maintained (body mass index [BMI] 18.5 to 24.9) to reduce blood pressure. Weight reduction lowers systolic blood pressure by 5 to 20 mm Hg per 22 lbs (10 kg) body weight loss.

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding weight management**.

**Hypertension (HTN): Omega-3 Fatty Acids**

**Omega-3 Fatty Acids**

Advise that the consumption of omega-3 fatty acids may not be beneficial for the management of hypertension, since their consumption does not appear to lower blood pressure.

**Fair**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade II**

**Hypertension (HTN): Dietary Protein**

**Dietary Protein**

Advise that the consumption of protein may or may not be beneficial for the reduction of blood pressure, since the effect of increased protein intake on blood pressure is unclear.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Soluble Fiber**

**Soluble Fiber**

Advise that the consumption of soluble fiber may or may not be beneficial for the reduction of blood pressure, since the effect of increased soluble fiber intake on blood pressure is unclear.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Potassium**

**Potassium**

Dietitians should advise individuals to consume adequate food sources of potassium as part of Medical Nutrition Therapy to reduce blood pressure. Research suggests that potassium intake lower than recommended levels (Dietary Reference Intakes [DRI]) is associated with increased blood pressure.

**Fair**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade II**

**Hypertension (HTN): Vitamins**

**Vitamin C**

Advise that the consumption of vitamin C may or may not be beneficial for the reduction of blood pressure, since the effect of increased vitamin C intake on blood pressure is unclear.

**Weak**, Imperative

**Vitamin E**

Advise that the consumption of vitamin E may or may not be beneficial for the reduction of blood pressure, since the effect of increased vitamin E intake on blood pressure is unclear.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Dietary Magnesium**

**Dietary Magnesium**

If magnesium is proposed as a therapy to reduce blood pressure, advise that the effect of magnesium as a single nutrient on blood pressure in healthy or hypertensive adults is unknown. The effect of dietary patterns with magnesium intake above the DRI on blood pressure in healthy or hypertensive adults is minimal. However, some dietary patterns that contain magnesium lower than recommended levels (DRI) may be associated with elevated blood pressure.

**Fair**, Conditional

**Recommendation Strength Rationale**

- **Conclusion statement is Grade II**

**Hypertension (HTN): Calcium**

**Calcium**

If calcium is proposed as a therapy to reduce blood pressure, advise that the effect of calcium as a single nutrient on blood pressure in healthy or hypertensive adults is unclear. Epidemiological studies report that dietary patterns containing calcium lower than recommended levels (DRI) may be associated with elevated blood pressure. The effect of dietary patterns with calcium intake above the DRI on blood pressure in healthy or hypertensive adults is minimal.

**Fair**, Conditional

**Recommendation Strength Rationale**

- **Conclusion statement is Grade II**

**Hypertension (HTN): Fruits and Vegetables**

**Fruits and Vegetables**

Advise the consumption of at least five to ten servings of fruits and vegetables per day, based on research reporting significant reductions in blood pressure after consumption of either the DASH dietary pattern or a diet rich in fruits and vegetables.

**Strong**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade I**

**Hypertension (HTN): Soy Foods**

**Soy Foods**

Advise that the consumption of soy foods may or may not be beneficial for the reduction of blood pressure, since the effect of increased soy food intake on blood pressure is unclear.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Garlic**

**Garlic**

Consumption of garlic may or may not be beneficial for the reduction of blood pressure, since the current evidence is inconclusive regarding its effect on blood pressure.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Cocoa and Chocolate**

**Cocoa and Chocolate**

Consumption of cocoa or chocolate may or may not be beneficial for the reduction of blood pressure, since the current evidence is inconclusive regarding its effect on blood pressure.

**Weak**, Imperative

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Caffeine**

**Caffeine Intake**

For those who consume caffeine, advise blood pressure monitoring; while acute intake of caffeine increases blood pressure, the effect of chronic caffeine intake is unclear.

**Weak**, Conditional

**Recommendation Strength Rationale**

- **Conclusion statement is Grade III**

**Hypertension (HTN): Alcohol Consumption**

**Alcohol Consumption**

For individuals who can safely consume alcohol, consumption should be limited to no more than 2 drinks (24 oz beer, 10 oz wine, or 3 oz of 80-proof liquor) per day in most men and to no more than 1 drink per day in women. A reduction in alcohol consumption may reduce systolic blood pressure by approximately 2 to 4 mmHg.

**Consensus**, Conditional

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding alcohol**.

**Hypertension (HTN): Management of Blood Pressure**

**HTN: Comprehensive Program for Blood Pressure Management**

Management of elevated blood pressure should be based on a comprehensive program including lifestyle modification (weight reduction, medical nutrition therapy and physical activity) and pharmacologic therapy. Research indicates that a comprehensive program can prevent target organ damage and improve cardiovascular outcomes.

**Consensus**, Imperative

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding management of blood pressure.**

**Hypertension (HTN): Goals of Therapy**

**HTN: Blood Pressure Treatment Goal**

A treatment goal of <140/90 mm Hg is recommended for individuals without comorbidities. This level is associated with preventing target organ damage and decreasing cardiovascular risk factors and complications.

**Consensus**, Imperative

**HTN: Blood Pressure Treatment Goal for Individuals with Diabetes or Renal Disease**

For individuals with hypertension and diabetes or renal disease, a treatment goal of <130/80 mm Hg is recommended. These individuals are at an increased risk for cardiovascular and renal morbidity and mortality.

**Consensus**, Conditional

**Recommendation Strength Rationale**

**The ADA Hypertension Expert Work Group concurs with the recommendations from the JNC 7, regarding goals of therapy**.

**Definitions**:

**Conditional versus Imperative Recommendations**

Recommendations can be worded as ***conditional*** or ***imperative*** statements. Conditional statements clearly define a specific situation, while imperative statements are broadly applicable to the target population without restraints on their pertinence. More specifically, a conditional recommendation can be stated in if/then terminology (e.g., If an individual does not eat food sources of omega-3 fatty acids, then 1g of EPA and DHA omega-3 fatty acid supplements *may* be recommended for secondary prevention).

In contrast, imperative recommendations "require," or "must," or "should achieve certain goals," but do not contain conditional text that would limit their applicability to specified circumstances. (e.g., Portion control should be included as part of a comprehensive weight management program. Portion control at meals and snacks results in reduced energy intake and weight loss).

**Levels of Evidence**

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| **Quality**<br><br>• Scientific rigor/validity<br>• Considers | Studies of strong design for question<br><br>Free from | Studies of strong design for question with minor methodological | Studies of weak design for answering the question | No studies available<br><br>Conclusion based on usual | No evidence that pertains question |

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| design and execution | design flaws, bias and execution problems | concerns<br><br>OR<br><br>Only studies of weaker study design for question | OR<br><br>Inconclusive findings due to design flaws, bias or execution problems | practice, expert consensus, clinical experience, opinion, or extrapolation from basic research | being addresse |
| **Consistency**<br><br>Of findings across studies | Findings generally consistent in direction and size of effect or degree of association, and statistical significance with minor exceptions at most | Inconsistency among results of studies with strong design<br><br>OR<br><br>Consistency with minor exceptions across studies of weaker designs | Unexplained inconsistency among results from different studies<br><br>OR<br><br>Single study unconfirmed by other studies | Conclusion supported solely by statements of informed nutrition or medical commentators | NA |
| **Quantity**<br><br>• Number of studies<br>• Number of subjects in studies | One to several good quality studies<br><br>Large number of subjects studies<br><br>Studies with negative results having sufficiently large sample size for adequate statistical power | Several studies by independent investigators<br><br>Doubts about adequacy of sample size to avoid Type I and Type II error | Limited number of studies<br><br>Low number of subjects studies and/or inadequate sample size within studies | Unsubstantiated by published studies | Relevan studies have no been do |
| **Clinical Impact**<br><br>• Importance of studies outcomes<br>• Magnitude of | Studied outcome relates directly to the question | Some doubt about the statistical or clinical significance of effect | Studies outcome is an intermediate outcome or surrogate for the true | Objective data unavailable | Indicate area for future research |

| Strength of Evidence Elements | Grade I<br><br>Good/Strong | Grade II<br><br>Fair | Grade III<br><br>Limited/Weak | Grade IV<br><br>Expert Opinion Only | Grade<br><br>Grade<br>Assigna |
|---|---|---|---|---|---|
| effect | Size of effect is clinically meaningful<br><br>Significant (statistical) difference is large | | outcome of interest<br><br>OR<br><br>Size of effect is small or lacks statistical and/or clinical significance | | |
| **Generalizability**<br><br>To population of interest | Studied population, intervention and outcomes are free from serious doubts about generalizability | Minor doubts about generalizability | Serious doubts about generalizability due to narrow or different study population, intervention or outcomes studied | Generalizability limited to scope of experience | NA |

This grading system was based on the grading system from: *Greer N, Mosser G, Logan G, Wagstrom Halaas G. A practical approach to evidence grading. Jt Comm. J Qual Improv. 2000; 26:700-712*. In September 2004, The ADA Research Committee modified the grading system to this current version.

**Criteria for Recommendation Rating**

| Statement Rating | Definition | Implication for Practice |
|---|---|---|
| **Strong** | A **Strong** recommendation means that the workgroup believes that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits in the case of a strong negative recommendation), and that the quality of the supporting evidence is excellent/good (grade I or II)*. In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the | Practitioners should follow a **Strong** recommendation unless a clear and compelling rationale for an alternative approach is present. |

| Statement Rating | Definition | Implication for Practice |
|---|---|---|
| | harms. | |
| **Fair** | A **Fair** recommendation means that the workgroup believes that the benefits exceed the harms (or that the harms clearly exceed the benefits in the case of a negative recommendation), but the quality of evidence is not as strong (grade II or III)*. In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms. | Practitioners should generally follow a **Fair** recommendation but remain alert to new information and be sensitive to patient preferences. |
| **Weak** | A **Weak** recommendation means that the quality of evidence that exists is suspect or that well-done studies (grade I, II, or III)* show little clear advantage to one approach versus another. | Practitioners should be cautious in deciding whether to follow a recommendation classified as **Weak**, and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role. |
| **Consensus** | A **Consensus** recommendation means that Expert opinion (grade IV)* supports the guideline recommendation even though the available scientific evidence did not present consistent results, or controlled trials were lacking. | Practitioners should be flexible in deciding whether to follow a recommendation classified **Consensus**, although they may set boundaries on alternatives. Patient preference should have a substantial influencing role. |
| **Insufficient Evidence** | An **Insufficient Evidence** recommendation means that there is both a lack of pertinent evidence (grade V)* and/or an unclear balance between benefits and harms. | Practitioners should feel little constraint in deciding whether to follow a recommendation labeled as **Insufficient Evidence** and should exercise judgment and be alert to emerging publications that report evidence that clarifies the balance of benefit versus harm. Patient preference should have a substantial influencing role. |

*Conclusion statements are assigned a grade based on the strength of the evidence. Grade I is good; grade II, fair; grade III, limited; grade IV signifies expert opinion only and grade V indicates that a grade is not assignable because there is no evidence to support or refute the conclusion. The evidence and these grades are considered when assigning a rating (Strong, Fair, Weak, Consensus, Insufficient Evidence - see chart above) to a recommendation.

Adapted by the American Dietetic Association from the American Academy of Pediatrics, Classifying Recommendations for Clinical Practice Guideline, Pediatrics. 2004;114;874-877.

### CLINICAL ALGORITHM(S)

Algorithms are provided in the original guideline document for:

- Hypertension nutrition practice guideline
- Hypertension nutrition assessment
- Hypertension nutrition diagnosis
- Hypertension nutrition intervention
- Hypertension nutrition monitoring and evaluation

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

The guideline contains conclusion statements that are supported by evidence summaries and evidence worksheets. These resources summarize the important studies (randomized controlled trials [RCTs], clinical trials, observational studies, cohort and case-control studies) pertaining to the conclusion statement and provide the study details.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

A priority aim and benefit of implementing the recommendations in this guideline would be to improve the percentage of individuals who are able to meet their treatment goal of reducing blood pressure.

### POTENTIAL HARMS

#### Risk/Harm Considerations

Safety issues should be considered for each form of treatment recommended. Factors to consider when exploring treatment options include:

- Certain factors, such as age, socioeconomic status, cultural issues and disease conditions, may need to be taken into consideration in the application of these guidelines.
- Taking blood pressure measurement may be harmful in the following circumstances: lymphedema, fistula, or arterial venous graft in the arm.
- Adverse side effects and potential drug-nutrient interactions may be observed in some patients receiving pharmacologic therapy.

- Consideration should be given to individuals engaging in high levels of physical activity, or in humid climates, resulting in excessive sweating due to the potential of hyponatremia.
- Potassium from food, supplements or salt substitutes can result in individuals with impaired kidney function and/or taking ACE inhibitors, renin inhibitors, angiotensin receptor blockers (ARBs), potassium-sparing diuretics or aldosterone antagonists.
- No defined intake level at which potential adverse effects of protein has been identified.
- It is concluded that as part of an overall healthy diet, a high intake of dietary fiber will not produce deleterious effects in healthy individuals. While occasional adverse gastrointestinal symptoms are observed when consuming some isolated or synthetic fibers, serious chronic adverse effects have not been observed.
- Excessive consumption of vitamin C may result in gastrointestinal disturbances, kidney stones, and excess iron absorption.
- There is no evidence of adverse effects from consumption of vitamin E naturally occurring in foods. However, adverse effects from supplements containing vitamin E may include hemorrhagic toxicity.
- While no defined intake level at which potential adverse effects of omega-3 polyunsaturated fatty acids has been identified, human in vitro studies report increased free-radical formation and lipid peroxidation with higher amounts of polyunsaturated fatty acids. Lipid peroxidation is thought to be a factor in the development of atherosclerotic plaques.
- It is important to note that the dark chocolate used in research may be different than the majority of commercially available cocoa and chocolate. Given the clinical significance of the decrease in blood pressure, caution is needed when considering dietary recommendations for foods that are high in fat and calories.
- Physician consultation is warranted prior to beginning any exercise program.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- This American Dietetic Association Evidence-Based Nutrition Practice Guideline is meant to serve as a general framework for handling clients with particular health problems. It may not always be appropriate to use these nutrition practice guidelines to manage clients because individual circumstances may vary. For example, different treatments may be appropriate for clients who are severely ill or who have co-morbid, socioeconomic, or other complicating conditions. The independent skill and judgment of the health care provider must always dictate treatment decisions. These nutrition practice guidelines are provided with the express understanding that they do not establish or specify particular standards of care, whether legal, medical, or other.
- This guideline is not intended as a replacement for interventions typically within the scope of practice of a certified exercise physiologist or other professional, for which adequate training in physical activity interventions and other therapies is necessary.
- While the guideline represents a statement of best practice based on the latest available evidence at the time of publishing, they are not intended to

overrule professional judgment. Rather, they may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

The publication of this guideline is an integral part of the plans for getting the American Dietetic Association Medical Nutrition Therapy (ADA MNT) evidence-based recommendations on hypertension to all dietetics practitioners engaged in, teaching about, or researching hypertension as quickly as possible. National implementation workshops at various sites around the country and during the ADA Food Nutrition Conference Expo (FNCE) are planned. Additionally, there are recommended dissemination and adoption strategies for local use of the *ADA Hypertension Evidence-Based Nutrition Practice Guideline*.

The guideline development team recommended multi-faceted strategies to disseminate the guideline and encourage its implementation. Management support and learning through social influence are likely to be effective in implementing guidelines in dietetic practice. However, additional interventions may be needed to achieve real change in practice routines.

Implementation of the Hypertension guideline will be achieved by announcement at professional events, presentations and training. Some strategies include:

- **National and Local Events** – State dietetic association meetings, an ADA House of Delegates training session and media coverage will help promote the guideline
- **Local Feedback Adaptation** – Presentation by members of the work group at peer review meetings and opportunities for continuing education unites (CEUs) for courses completed
- **Education Initiatives** – The guideline and supplementary resources are freely available for use in the education and training of dietetic interns and students in approved Commission on Accreditation of Dietetics Education (CADE) programs
- **Champions** – Local champions have been identified and expert members of the guideline team will prepare articles for publications. Resources are provided that include PowerPoint presentations, full guidelines, and pre-prepared case studies.
- **Practical Tools** – Some of the tools that will be developed to help implement the guideline include specially designed resources such as clinical algorithms, a pocket guide, slide presentation, training and toolkits.

Specific distribution strategies include:

Publication in Full – The guideline will be available electronically at the ADA Evidence Analysis Library (www.adaevidencelibrary.com) and has been announced to all the ADA dietetic practice groups. The ADA Evidence Analysis Library will also provide downloadable supporting information and links to relevant position papers.

## IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness
Staying Healthy

### IOM DOMAIN

Effectiveness
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

American Dietetic Association (ADA). Hypertension evidence based nutrition practice guideline. Chicago (IL): American Dietetic Association (ADA); 2008. Various p. [3 references]

### ADAPTATION

The levels of evidence was based on the grading system from: *Greer N, Mosser G, Logan G, Wagstrom Halaas G. A practical approach to evidence grading. Jt Comm. J Qual Improv. 2000; 26:700-712*. In September 2004, The American Dietetic Association (ADA) Research Committee modified the grading system to this current version.

The grades of recommendation were adapted by the American Dietetic Association (ADA) from the American Academy of Pediatrics, Classifying Recommendations for Clinical Practice Guideline, Pediatrics. 2004;114;874-877.

The recommendations are based on a combination of recent American Dietetic Association evidence analysis and recommendations from the guidelines developed by the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure.

### DATE RELEASED

1998 (revised 2008 Apr)

### GUIDELINE DEVELOPER(S)

American Dietetic Association - Professional Association

## SOURCE(S) OF FUNDING

American Dietetic Association

## GUIDELINE COMMITTEE

Hypertension Evidence-Based Guideline Workgroup

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

In the interest of full disclosure, American Dietetic Association (ADA) has adopted the policy of revealing relationships workgroup members have with companies that sell products or services that are relevant to this topic. Workgroup members are required to disclose potential conflicts of interest by completing the ADA Conflict of Interest Form. It should not be assumed that these financial interests will have an adverse impact on the content, but they are noted here to fully inform readers:

None of the work group members listed above disclosed potential conflicts of interest.

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: White JV. Hypertension. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 15 p.

The guideline will undergo a complete revision every three to five years.

## GUIDELINE AVAILABILITY

Electronic copies: Available from the American Dietetic Association Web site.

## AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Executive summary of recommendations. Chicago (IL): American Dietetic Association; April 2008. Available from the American Dietetic Association Web site.

## PATIENT RESOURCES

None available

## NGC STATUS

This summary was completed by ECRI on September 1, 1998. It was verified by the guideline developer on December 1, 1998. The summary was updated by ECRI on April 16, 2004. The updated information was verified by the guideline developer on June 21, 2004. This summary was updated by ECRI Institute on November 6, 2008. The updated information was verified by the guideline developer on December 9, 2008.

## COPYRIGHT STATEMENT



# DISCLAIMER

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Readers with questions regarding guideline content are directed to contact the guideline developer.



Date Modified: 12/29/2008